

S P E C I A L R E P O R T

Transportation and Economic Prosperity

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I. Transportation and Economic Prosperity

The relationship between transportation and economic prosperity can be seen throughout history as cities first arose around ports and navigable rivers, then along railroad lines, and finally near interstate highways and large airports. Transportation has always been a central part of economic development and the vitality of a community. Without good transportation access, a region's economy eventually declines as businesses, jobs and people move elsewhere.

The Missouri economy depends on transportation for freight and employee movement, for attracting and retaining businesses, and for tourism. Most manufacturing businesses rely heavily on road, rail, airport and/or port access for the movement of raw materials and finished goods. With the development of JIT (Just In Time) manufacturing and other cost savings procedures, reliable transportation routes and travel times are critical. Agriculture businesses are a more dispersed industry that usually relies on road, rail and water modes of travel. Good, inexpensive transportation is key for getting bulk agricultural products to markets that are usually far away. Service-related industries also rely on a good network of roads and airports for business success.

In terms of business attraction, transportation access is always one of the top factors in location decisions. Companies want to locate where they have improved access to raw materials and markets for their final products. Transportation alone may not be the deciding factor, but it is important enough that it will almost always eliminate

communities with poor access. Four-lane highways, for example, are very common search criteria. Relocating businesses also want to know that they will have access to a qualified labor market. A business has to attract desirable employees so it needs to be located where people can easily travel to and from work.

Unfortunately, transportation can go largely unnoticed if it is easy to use, efficient, and uneventful during travel. Transportation is not usually thought of as a separate entity but as a connection between places. It is only noticed when the roads are rough, the traffic congested, the airport confusing, etc. Business owners expect transportation modes to be dependable, efficient and well maintained. With the speed of business change in today's economy, companies cannot afford to spend their time worrying about problematic transportation, they will simply move where that is not a concern.

The quality of life people experience is also affected by the opportunities that transportation brings, and the impacts that it has on cultural and environmental resources. Through the improved mobility that good roads and public transit offer citizens, the employment opportunities for individuals has greatly increased. This fact, however, has presented new problems such as traffic congestion, scattered land uses, increased traffic accidents, air pollution, etc.

Finally, transportation improvements do not guarantee economic prosperity. Although the importance of good transportation to economic development cannot be denied, it is unrealistic, and undesirable, to develop four-lane highways, large airports, or railroads through every community. Alternative marketing and transportation strategies must be considered along with smart transportation planning to help communities, and therefore the state, increase economic prosperity while retaining a high quality of life.

II. Overview of Missouri's Transportation System

Missouri boasts the 6th largest highway system in the nation with approximately 32,372 miles. It also has the 2nd and 3rd largest rail terminals in the nation. The state has 2 major navigable rivers with over 1,000 miles of navigable waterways. There are also 2 international airports and over 100 general aviation facilities.

MAP 1 on the following page shows the railroads, airports, and major roads of Missouri.

MAP 1: RAILROADS, AIRPORTS AND MAJOR ROADS IN MISSOURI

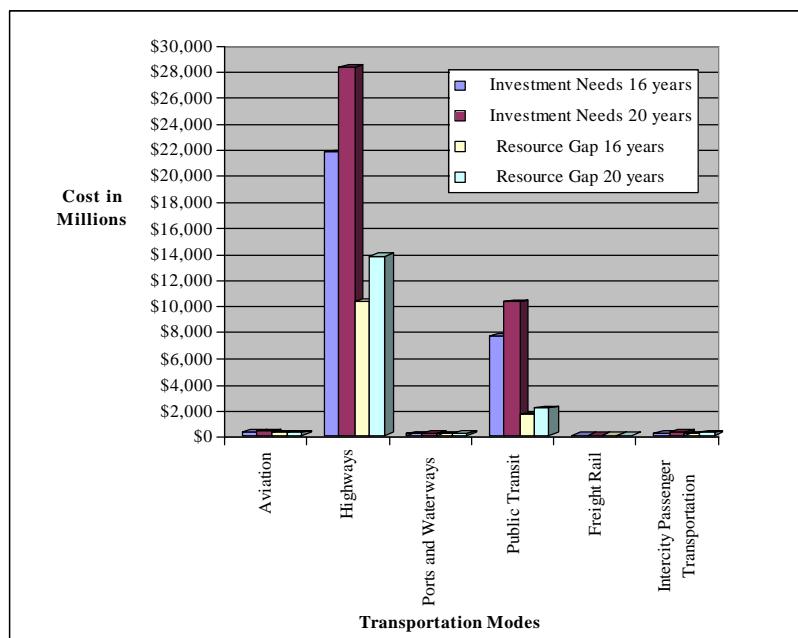


Source: Missouri Department of Economic Development - Research and Planning, January 2000.

CHART 1 below and **TABLE 1** on page 5 provide a summary of the transportation investment needs and resource gaps as identified by the Total Transportation Commission of Missouri's 1997 Final Report.¹ The Commission's report shows that major investments are needed in highways and public transit, which represent 72% and 20% of the total 20-year investment needs respectively. However, the report also shows that major resource gaps exist in meeting these needs.

Please note the dollar figures used in this paper are from the 1997 Final Report and are in need of adjustment based on current budget concerns. The Missouri Department of Transportation (MoDOT) has recently reported that it will not be able to meet current 15-Yr. Highway Plan objectives. The figures do, however, give some idea of the relative need of each transportation mode in terms of investment.

CHART 1: TRANSPORTATION NEEDS AND RESOURCE GAPS (in Millions)



Source: Total Transportation Commission of Missouri. *Connecting Missouri to the Future*. Final Report. St. Louis, MO. 1997. Tables IV-5, IV-6, IV-7.

¹ Total Transportation Commission of Missouri. *Connecting Missouri to the Future*. Final Report. St. Louis, MO. 1997.

TABLE 1: TRANSPORTATION NEEDS AND RESOURCE GAPS (in Millions)

Transportation Mode	Investment Needs		Resource Gap	
	16 years	20 years	16 years	20 years
Aviation	\$267	\$347	\$182	\$238
Highways	\$21,740	\$28,253	\$10,316	\$13,766
Ports and Waterways	\$116	\$151	\$93	\$121
Public Transit	\$7,667	\$10,254	\$1,598	\$2,061
Freight Rail	\$28	\$31	\$14	\$16
Intercity Passenger Transportation	\$171	\$262	\$94	\$178

Source: Total Transportation Commission of Missouri. *Connecting Missouri to the Future*. Final Report. St. Louis, MO. 1997. Tables IV-5, IV-6, IV-7.

Looking more closely at each transportation mode, the following section describes the different transportation systems in Missouri and the specific investment needs that were identified by the Total Transportation Commission of Missouri for each mode.

1. Aviation

The airport system of Missouri consists of 115 publicly owned airports. There are 2 major commercial airports (St. Louis and Kansas City) and 5 local commercial airports (Cape Girardeau, Columbia, Joplin, Kirksville, and Springfield). 25 airports have runway lengths greater than 5000', which is generally needed for corporate jets. Over 160,000 tons of cargo and 20 million airline passengers are transported annually by air in Missouri.

Investment needed to rehabilitate and improve the general aviation airports over the next 16 to 20 years is estimated to be between \$267 to \$347 million. Typical projects include navigation aid upgrades, runway/taxiway extension, construction or rehabilitation, and taxi lanes. An estimated resource gap of \$182 to \$238 million is projected over this 16 to 20 year period.

2. Bicycles and Pedestrians

Bicycle and pedestrian facilities are commonly used for local trips within a community. This transportation mode requires minimal infrastructure, imposes less stress on the environment, and contributes to other goals such as health, sense of community, and more compact development patterns. It is estimated that 1 million people in the state bicycle and 3.75 million walk for recreation annually.

With the exception of the successful Katy Trail, there is no statewide plan for bicycle and pedestrian facilities. Since this transportation mode is generally for local use,

communities and regional planning agencies are best suited to develop these facilities. The State, however, could assist both in funding and encouraging local and regional planning. Highway funding could be contingent on local planning and implementation of alternative transportation modes to coincide with road improvements. The Intermodal Surface Transportation Efficiency Act (ISTEA) also provides money for bicycle and pedestrian facilities but only if a plan is developed first.

3. Highways

The Missouri highway system has approximately 32,372 miles of roadway, with 1,178 of those miles being interstate. A 1995 federal program, the National Highway System (NHS) plan, funds restoration and upgrading of economically significant roadways in Missouri. The NHS encompasses 4,475 miles of Missouri's highway system. This represents only 14% of the state's total highway system, yet these roads carry 48% of the travel traffic in the state.

Estimated highway needs over the next 16 to 20 years is \$21.74 to \$28.25 billion, with two-thirds of this total going for additional lanes and creating new four-lane highways. An estimated resource gap of \$10.32 to \$13.77 billion is projected over the 16 to 20 year period.

4. Ports and Waterways

Ports serve as intermodal facilities to interface between barge, rail and truck transportation. The ports provide a low cost mode of transportation for bulk freight. Cargo is typically a non-time sensitive product such as coal, minerals, petrochemicals, grain, etc. **MAP 2** on page 7 shows the ports and toll ferries in Missouri.

Three major river corridors extend into the state of Missouri; the Upper Mississippi River from the Iowa state line to the Ohio River, the Lower Mississippi River from the Ohio River to the Arkansas state line, and the Missouri River. Approximately 1,040 miles of navigable waterways exist in the state. Navigable means channels are at least 9' deep and 300' wide. There are 14 public port authorities, 12 on the Mississippi River and 2 on the Missouri River. There are also over 200 privately owned and operated water terminals along these two rivers. The value of cargo handled by these ports annually is almost \$4 billion, including more than \$2 billion in exports.

Current and future investment needs include construction of harbor facilities, storage and conveying equipment, and rail/road linkages. The cost to meet these investment needs for the next 16 to 20 years is projected at \$116 to \$151 million. The estimated resource gap is \$93 to \$121 million for the same period.

MAP 2: PUBLIC PORTS AND TOLL FERRIES IN MISSOURI



Source: Missouri Department of Transportation-Waterways Page. Missouri Department of Transportation.
5 January 2000. <<http://www.modot.state.mo.us/trans/map.htm>>.



5. Public Transit and Paratransit

Public transportation in Missouri provides over 70 million rides annually. There are several public transportation systems throughout the state, but they vary in size:

- The two largest are the Bi-State Development Agency in St. Louis and the Kansas City Area Transportation Authority.
- Four smaller urban systems exist in Columbia, Jefferson City, Springfield, and St. Joseph. They provide fixed route transit services to the public.
- Over 200 small community transportation systems exist, called paratransit, which focus on the needs of disabled or elderly people. These networks generally do not operate on a fixed route but instead transport patrons as needed within a defined geographic area.

Public transportation in St. Louis and Kansas City is studied in much more detail than in the rural areas. Funding limitations in recent years have greatly reduced service areas and ridership in many of the smaller urban areas throughout Missouri.

Investment needs for public transportation in Missouri range from modern light-rail transit systems in large metro areas to expanded bus and van service in smaller urban and community systems. New or renovated maintenance facilities, parking lots and other passenger amenities are also needed. Investment needed over the next 16 to 20 years is estimated at \$7.67 to \$10.26 billion for public transit capital investment and operating cost. The resource gap is estimated at \$1.6 to \$2.06 billion for the same period.

6. Freight Rail

Missouri has long been the place where eastern railroads meet western railroads with St. Louis and Kansas City handling most of the interchanges. The rail system in Missouri is over 4,400 miles long. Two major Class I carriers, Burlington Northern and Santa Fe (BNSF) and Union Pacific (UP), operate 64% of the statewide system. Currently, Norfolk Southern is in the process of acquiring many railroad lines. In 1995, there were 4,335 at-grade rail-highway crossings in the state. This equates to approximately 1 crossing for every 1 mile of rail.

Investment needs for Missouri railroads involve capital improvements of light density line (LDL) railways that support low traffic levels in local communities. These lines are significant economic engines for many smaller areas. Investment for the next 16 to 20 years is estimated at \$28 to \$31 million. The resource gap for the same time period is estimated at \$14 to \$16 million.

7. Intercity Passenger Transportation

This transportation mode consists of passenger trains that connect major cities throughout Missouri and the Midwest. Six Amtrak trains have served numerous cities within Missouri including: Kansas City, Independence, Lee's Summit, Warrensburg, Sedalia, Jefferson City, Hermann, Washington, Kirkwood, St. Louis, Poplar Bluff, La Plata, and Marceline.

A study was recently completed to evaluate state supported passenger rail options between St. Louis and Kansas City. The MoDOT sponsored study evaluated four alternative operating scenarios involving Amtrak. The recommended scenario was to build on the base service, by optimizing schedules and increasing train speeds, while minimizing cost implications through reduced annual expenditures and increased ridership. Some of the study's conclusions include:

- Instituting rail station and ticketing procedure improvements. For instance, larger rail stations could contain local public transit, car rentals and taxi service.
- Purchasing of Diesel Multiple Units (DMU's) self-propelled passenger cars that are highly fuel-efficient and require less crewmembers.
- Contracting maintenance of DMU's and train operation to third parties (where Amtrak could be a bidder) to lower labor costs.
- Improving on-board conveniences such as food and beverage services and business amenities like computer outlets for laptops.
- Increasing marketing efforts.

Investment needs are considered uncertain due to the dependence on future federal policies, technology, and Amtrak. A figure of \$171 to \$262 million over the next 16 to 20 years is given as an estimate. A resource gap of \$94 to \$178 million for passenger rail capital improvements and operating assistance is predicted over the same period.

III. Current Issues Involving Transportation and Economic Development

States around the country are facing many of the same transportation issues that Missouri faces. The distinction, in terms of economic development, will be how the various states choose to address these issues. Transportation is not just a separate line item in the budget but a vital element in many state goals such as economic development, environmental quality, safety, and increased quality of life. Future transportation planning should be guided by decision-makers that represent all of the major state goals.

Some Challenges Facing Missouri's Transportation System:

1. Addressing the lack of funding sources to fully implement the 15-Year Highway Plan. In November 1998, the Missouri Department of Transportation reported that the Plan could not be completed under the current budget.
2. Dealing with an aging highway infrastructure with many roads already in poor condition.
3. Being mindful of the need for continued improvements in safety. Traffic accidents and fatalities, despite improved safety, will always be a top concern.
4. Recognizing the dependence of the public on the automobile for mobility. This dependency has raised concerns for populations that cannot take advantage of automobiles due to age, income, disabilities, etc.
5. Addressing the need for increased funding for urban and rural public transit systems. Maintenance and replacement of aging systems are critical to ongoing service.
6. Responding to the continued need to improve the business climate in Missouri by offering better interconnected, multi-modal transportation systems.
7. Alleviating traffic congestion that adds to driver frustration, undependable travel times, air pollution, and increased infrastructure cost.
8. Dealing with the absence of detailed local land use planning and implementation programs to address the issues that new or improved road developments create.

IV. How Can We Improve Transportation in the Future?

Future economic prosperity in Missouri will be greatly impacted by how Missouri addresses its transportation issues. In today's changing economy of ever increasing state competition for business attraction and retention, a dependable and efficient transportation system is a necessity. Businesses demand it and will bypass locations that do not meet this basic need.

A higher quality of life is also something many businesses and individuals demand. The old saying "jobs go where the boss goes" is certainly as true today as it was in the past. As companies continue to move out of the cities into suburban communities to escape the traffic congestion and higher taxes, they inadvertently add to the problem. These communities usually undergo fast growth that is poorly planned from a land use and transportation perspective. This eventually diminishes quality of life by causing increased traffic congestion, accidents, air quality problems, higher taxation for infrastructure, and destruction of valued community features.

Transportation in this new century must address both economic prosperity and quality of life concerns to both retain and attract businesses and people.

Future Needs:

- 1. A need for holistic planning, prioritization, and performance measurement for transportation investments.*

Because transportation policies and improvements have such a wide impact, they should be developed and prioritized by professionals in the various fields of transportation, engineering, land and social planning, environment, economic development, etc. Local citizens should also be involved in transportation planning since it will impact their economy and community.

Performance measurement is critical in determining whether or not transportation goals are being met and why. As with development and prioritization, successful performance should be measured on the wide range of criteria and not just engineering and budgetary considerations. Measures of performance should be made available to the public and any changes to transportation projects should have clearly identified reasons.

- 2. A need for financing options that adequately fund future transportation goals.*

Transportation plans and projects need a dependable source of funding if goals are to be met. The funding issue is currently under debate and revolves around many options such as: increasing the sales tax or gasoline tax, increasing user fees, establishing toll roads, etc. A study of state transportation financing in other states that have a successful transportation network may be helpful in this debate.

- 3. A need to increase safety.*

Safety should always be a high priority for transportation planning.

Recommendations for safety improvements include:

- Development of a safety management system that collects data on all transportation modes, evaluates the impact of transportation improvements on safety and utilizes this information for future transportation planning.
- Development of a highway safety plan and implementation schedule that includes road improvements where unsafe conditions exist, educational programs for the public, and law enforcement to reduce unsafe driving habits.
- Improve air travel safety through standardized instrument approach procedures using global positioning systems (GPS), develop a statewide weather reporting system using fiber optics, implement tall structure zoning around airports and established air patterns, and improve pilot education.
- Improve railroad grade crossings to include upgraded signaling and grade separations where feasible.

4. A need to maintain existing roads and to improve economically significant highways.

The maintenance of existing roadways is critical to reducing safety hazards and improving efficiency. This also lowers transportation cost for individuals and businesses. A transportation management system, which maintains a roadway and maintenance inventory and utilizes life cycle cost analysis, would help in this endeavor.

Missouri has more lane miles of state highway than any other comparably sized state in the nation. With limited resources, local low volume roads that the state currently maintains could be turned over to local agencies as long as roadway safety is not compromised. This would free up resources for more critical state roads.

As part of the holistic planning of transportation projects, economically significant highways should be enhanced as needed to improve safety and travel times. Many highways are regionally important to rural areas of the state and should be improved where necessary. These highways need to be strictly defined in a way that accurately reflects their economic value; otherwise all highways could be classified as economically significant.

5. A need to implement multi-modal transportation policies and actions that support an integrated transportation network.

Developing an integrated system of dependable transportation alternatives and connections will increase personal mobility and lower business costs. It can also reduce the use of roadways in urban areas, thereby helping to improve air quality and traffic congestion.

Recommendations for creating a multi-modal transportation network in Missouri:

- Enhance the connectivity of Missouri's transportation network of highways, waterways, airports, and railways through improved intermodal facilities. This network must then be heavily promoted, focusing on underutilized transportation modes. Detailed, up-to-date information on the transportation system could be marketed to existing and relocating businesses.
- Coordinate planning of public transit services so they provide continuous, interconnected service to patrons. People will only use public transportation if it is perceived as being convenient, safe, affordable, and dependable. For this reason, public transit must meet these goals and market them to increase ridership.
- Expand intercity passenger transportation, local public transit and paratransit in existing and new areas. Out-dated transportation equipment should also be modernized. Surveys and local planning meetings with citizens could help identify demand and needed services.

- Pedestrian and bicycle needs should be evaluated for implementation in the development of any new transportation project.
- Upgrade regionally significant airports to support a wider range of aircraft and services to benefit passengers and businesses. Regional airport authorities could aid in this goal.
- Expand port and waterway usage by improving port facilities and maintaining a long navigation season.

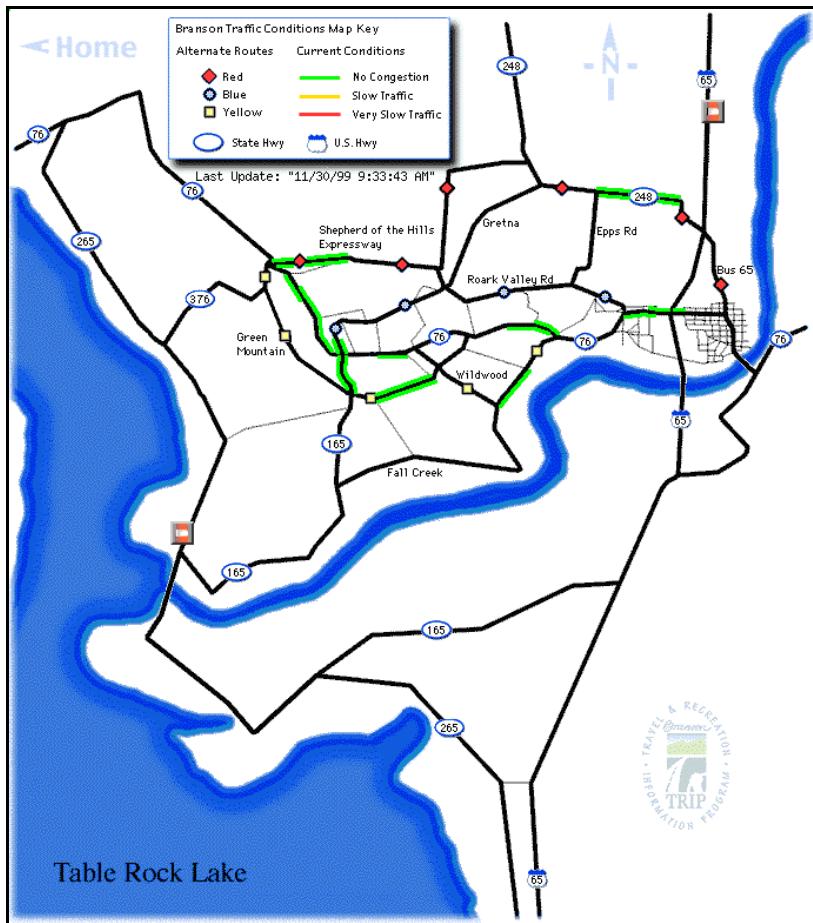
6. *A need to continue to utilize new technologies.*

Advanced technologies can improve decision-making and safety, increase efficiency, and lower long-term transportation costs. A progressive transportation network that utilizes improved technologies will also retain and attract companies that see Missouri as a leader in this critical business need.

Some current technological advances being put to use by MoDOT include the following:

- To create safer and more efficient highways, MoDOT uses a technology called Intelligent Transportation Systems (ITS) to manage traffic in several areas of the state. This technology consists of traffic sensors and closed-circuit cameras that record local traffic conditions constantly. This data is used by a Traffic Management Center to inform drivers of road and traffic conditions through radio broadcast, roadside message signs, and web sites. An example of a web site showing current traffic conditions can be seen in **Figure 1** on page 14. Springfield and Branson are currently using the ITS and soon Kansas City and St. Louis will be as well. The plan is for this system to eventually be implemented statewide.
- MoDOT began using longer lasting asphalt paving in 1999 called “Superpave”. This asphalt performs better under extreme temperatures and heavy traffic loads than traditional asphalt pavements. This will improve safety and lower maintenance costs where it is used.
- Material improvements have been implemented by MoDOT to increase durability and safety. This includes high-performance concrete and composite reinforcements for bridges.
- Geographic Information Systems (GIS) are computerized mapping and database programs that give transportation planners the ability to map and analyze various routing and design options early in the highway planning process. Different layers of information, such as soil conditions, slope, environmentally sensitive areas, existing land use, historic features, etc., can be analyzed together to help make better informed transportation decisions in a shorter timeframe. This technology should be utilized early in a project for cost effectiveness and in public meetings to illustrate different design options.

FIGURE 1: BRANSON WEB MAP (ITS)



Source: [Missouri Department of Transportation-Intelligent Transportation Systems-Branson Trip Page](http://branson.tripusa.com/). Missouri Department of Transportation. 5 January 2000. <<http://branson.tripusa.com/>>.

7. *A need for concurrent transportation and land use planning.*

There are very different transportation concerns when urban and rural areas are compared. Many urban businesses and residents are concerned with traffic congestion and pollution, bicycle and pedestrian connections, and dependable public transit. Rural areas are generally more concerned with good highway access. As rural communities begin to grow, however, traditional urban concerns become their concerns as well. This reality speaks to the need for land use planning in conjunction with transportation planning.

When new roads are built or greatly improved, development of land surrounding the road usually follows. Unfortunately most of the increased growth is poorly planned, from a community aspect, leading to common undesirable side effects such as:

- Increased traffic accidents due to uncontrolled curb cuts and road access.
- Scattered development that creates higher infrastructure costs to a community.
- Disconnected land uses that require driving an automobile to access community services.
- Increased land price speculation along highways that discourage a mix of business and residential land uses.
- Increased traffic congestion.
- Loss of many scenic qualities in a community that are typically viewed along the local roads.

Therefore, new or improved roads need to be designed within a planned framework to preserve the valued characteristics of a community. Good land planning and implementation programs allow a community to benefit from the economic prosperity roads bring while protecting and enhancing the desired characteristics of the community.

Local land use and transportation planning is not something many communities will do voluntarily or without incentives. Local land use planning in many states, such as Oregon, Washington, Rhode Island, California, Florida, Nebraska, South Dakota, Kentucky, and Georgia, is mandated. This requirement is usually tied to an incentive such as state funding assistance. Missouri, according to an American Planning Association Special Report², has weak planning requirements that offer little detail to aid communities in land use or transportation planning.

Local communities should designate, at a minimum:

- Where different land uses will be permitted and the density allowed before new road projects are started.
- Alternative transportation modes that provide for public transit, pedestrian, bicycle or other means of travel to connect community businesses and residents. This should be planned along with road improvements so they are compatible and complementary.
- Conservation of important local landscapes and structures.

Missouri has not updated its planning laws to keep pace with the change in population growth or other state “Smart Growth” initiatives. This is a need that can be addressed by first studying the best practices in state and local government planning and applying those methods to Missouri. Many organizations, such as the American

² American Planning Association. *Planning Communities for the 21st Century*. Special Report. Washington, D.C. 1999.

Planning Association, Urban Land Institute, Smart Growth Network, and others, can provide additional information.

V. Summary

The future of transportation and economic prosperity are closely linked in Missouri. Highway maintenance and enhancements will continue to be a core concern as will public transportation. Comprehensive planning and dependable funding sources are needed to ensure the long-term viability of these transportation modes that so closely and directly effect economic development, safety, and the environment.

Improving the intermodal nature of Missouri's transportation system is also critical for economic health. Transportation modes need to be interconnected so that businesses and people can depend on a variety of transportation alternatives to meet their needs. Technology and facilities improvements, along with system coordination and planning, can improve intermodal use.

Finally, the places that we live and work need to be better planned. Communities want to take advantage of transportation improvements while, at the same time, minimizing the detrimental side effects of sprawl that usually follows. Coordinated transportation and land use planning can help preserve community character, connect transportation modes, and improve economic development potential.

The long-term economic health of Missouri will be greatly impacted by how the state chooses to address transportation issues. The infrastructure of the past and future can serve Missouri well, but only if proactive steps are taken.

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